ABSTRACT

A turbine nozzle (2) that, among components constructing a turbine, reaches particularly high temperature is efficiently cooled with a relatively simple structure. A double casing structure in which a turbine casing (7) is provided outside a turbine shell (5) is formed. The turbine casing (7) functions as a flow path (24) for compressed air (20→21) before combustion. The turbine shell (5) covers a turbine nozzle (2) and a radial turbine impeller (3) and forms flow paths (15, 16) for combustion gas (10→11→12→13). The compressed air (21) before combustion flowing in the flow path (24), for compressed air, having air-tightness between itself and the outside air is blown to the turbine nozzle (2) through a through-hole (51) penetrating both wall surfaces of the turbine shell (5). By this, the turbine nozzle (2) is cooled and the compressed air used to cool the turbine nozzle is made to flow toward the turbine impeller (3). As a result, the entire volume of compressed air (20) taken into the turbine contributes to mechanical work for driving the turbine impeller (3).